

Stratos[®] **QUADRA**

————— ✨ ✨ ✨ ✨ ————— **FOUR AREA**
HIGH SENSITIVITY SMOKE DETECTOR



Installers handbook

LM 80010 issue 6 - Software Rev. 1.2 Onward



**THE QUEEN'S AWARD
FOR TECHNOLOGICAL
ACHIEVEMENT**



Quality system cert. no. 404
Assessed to ISO 9001

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Written by Mark Symonds - Software Director, Peter Fox - Managing Director,
Kit Girling - Technical Director.

Illustrations & layout by ElmTree Design 01462 459666

Introduction

Stratos-Quadra[®] is an aspirating Smoke Detection system which is capable of independently identifying four separate fire sectors. This is achieved by using four separate micro-laser detection transducers which are electronically scanned at high speed. Like other Stratos products, the system has been designed to ensure that installation and commissioning is as simple as possible.

The system incorporates a patented 'artificial intelligence' known as *ClassiFire*[®] which guarantees as accurately as possible that the detector sensors condition themselves to set appropriate sensitivity, alarm thresholds and permissible nuisance alarm rates to suit the operating environments protected by the system. *ClassiFire* intelligence also monitors the detector chamber and dust separator for contamination, continually adjusting the appropriate operating parameters to counteract the negative effects of such contamination.

Like other Stratos detectors, the *Stratos-Quadra* is able to provide a consistent level of protection in a very wide range of environments by continually making minor adjustments to sensitivity. These adjustments are made on a sector-by-sector basis, which means that separate sampling pipes can protect environments which are diverse in nature.

This handbook gives information likely to be needed for most installations, but for more detailed information on subjects such as Fresh Air Referencing, please refer to the complete Technical Manual.


United Kingdom
01462 440666

Netherlands
+31 182 635696

Finland
+358 (0)208 652131

Help Line 

NB 

	<i>This equipment should be installed by trained personnel</i>
	<i>This equipment is not designed for insertion in IT mains system</i>
	<i>The mains supply must be connected in accordance with BS 5839 part 1 1988 section 16-2 or to local standards as applicable - Flexible connection to a fused plug is not normally permissible.</i>

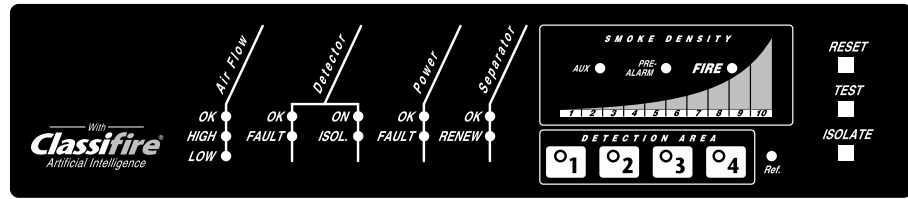
*AirSense Technology has taken every care to ensure that *Stratos-Quadra* is as simple to install as possible, but in case of difficulty please contact our **Help Line** to ensure trouble free installation.*

Note: *There are no user codes that employ the calendar function to access or operate other features.*

The end of calendar function is defined as 31 Dec. 2035; after this date the detector should be returned to the manufacturer for refurbishment.

Controls & Indicators

Controls & indicators



Air Flow

(OK, High, Low) These indicators show the status of the air flow through each of the sampling pipes. If a High or Low signal is indicated, then a 'fault' signal for that pipe will be transmitted to the host Fire Alarm panel (if used). When first powered up or when started by the user, the Air Flow 'OK' LED will flash, indicating that detector is setting its high and low flow thresholds for each pipe.

Detector

(OK, Fault & On, Isol.) These indicators show whether the detector is functioning correctly or not and if it is isolated or on-line. If either the 'Fault' or 'ISOL' is illuminated, then a fault condition will be transmitted to the host Fire Alarm panel. **Note:** The exception to this is when Stratos-Quadra is in Programmed Isolate mode. See programmable function 41 (page 20).

NB 

Power

(OK, Fault) These indicators show the status of both the battery back-up and the mains supply. If the amber 'Fault' indicator is flashing, then this indicates a battery fault. If it is steadily illuminated it indicates a mains electricity failure. If the 'Fault' indicator is illuminated, then a fault condition is transmitted to the host Fire Alarm panel. During mains power failure the unit can switch to optional power save mode, reducing the aspirator speed and dimming the indicator lights, see function 50, page 21.

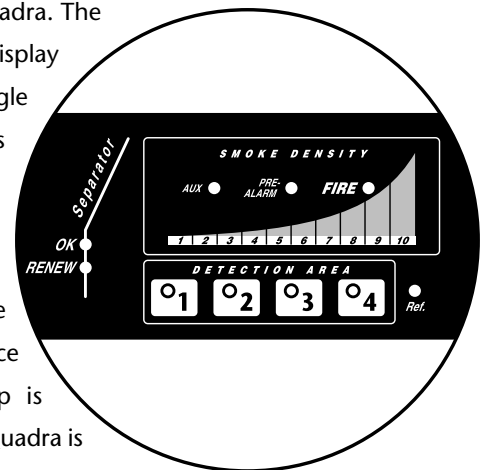
Status Indicator LEDs

The following table lists all the possible status lights that the detector will display along with a brief explanation of what they mean.

Display	Meaning
Airflow OK illuminated steady Airflow OK flashing. Airflow HIGH illuminated steady Airflow LOW illuminated steady	Normal operation. <i>The air flow is within limits.</i> The detector is currently setting up the air flow high and low thresholds. The air flow is high. <i>The sampling pipe may be broken.</i> The air flow is low. <i>The pipe may be blocked or the aspirator faulty.</i>
Detector OK illuminated steady Detector FAULT flashing. Detector FAULT illuminated steady	Normal detector module operation. <i>No faults.</i> The comms error rate is too large. <i>Check that the unit is correctly earthed.</i> <i>A detector head fault or process error has occurred.</i>
Detector ON illuminated steady Detector ISOL illuminated steady Detector ON flashing	Normal operation. <i>The sector is on-line and capable of generating alarms.</i> The detector is Isolated and not capable of generating alarms. Demonstration mode has been entered. (see page 34)
Separator OK illuminated steady Separator RENEW flashing Separator RENEW steady	Normal separator operation. <i>No faults.</i> The dust separator has been removed. The dust separator needs replacing.
Power OK illuminated steady Power FAULT flashing Power FAULT illuminated steady	Normal operation. <i>No faults.</i> Battery fault. <i>The battery is discharged or not connected.</i> Mains fault. <i>The system is running from stand-by batteries.</i>

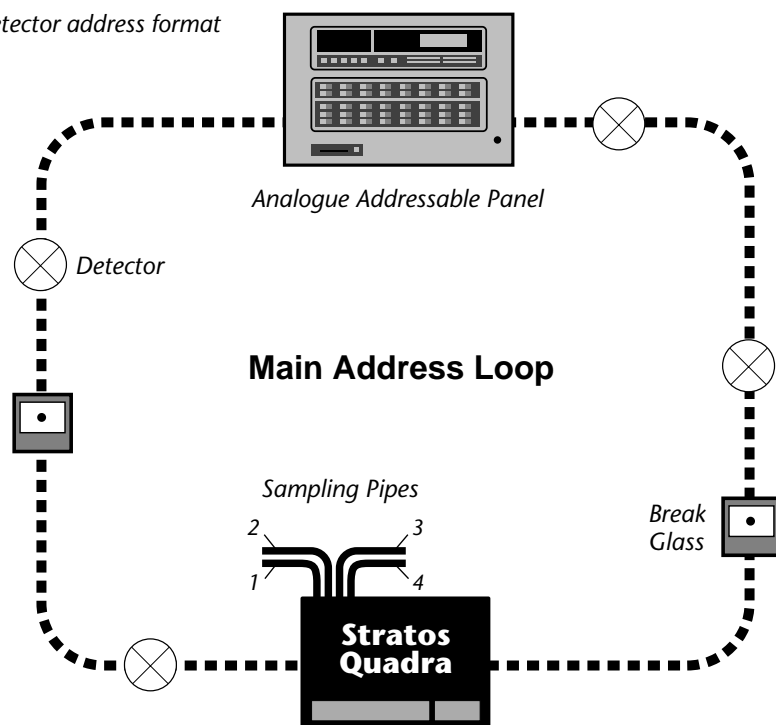
Detection Areas

These indicators are unique to Stratos-Quadra. The purpose of these displays is to permit the display of four separate detection sectors with a single display panel. The Detection Area LEDs index sequentially from detection area 1 to 4. When the relevant Detection Area LED is flashing, the entire display panel (including Isolate, Test & Reset keys) relate to the detection area/pipe indicated. If a Reference Detector is connected, the 'Ref.' lamp is automatically enabled when the Stratos-Quadra is reset to factory default settings (see page 13)



The LEDs will ordinarily scan at relatively high speed. This scan rate slows for display purposes upon receipt of any fire or fault signal. The actual scan speed for the separate sampling pipes is several times per second, so no appreciable delay is experienced in generating alarms.

Detector address format



Separator

(OK, Renew) These indicators signal when the dust separator needs replacing. A flashing 'RENEW' indicator shows that the dust separator has been removed. When the Separator Renew indicator is illuminated a Fault condition is transmitted to the host Fire Alarm panel. See 'Changing the Dust Separators' (Page 37) for more details.

Smoke Density

This bargraph shows any abnormal smoke density in the Detection Area. It should be noted that unlike other Smoke Detectors that contain a bargraph, due to the ClassiFire intelligence, the *Stratos-Quadra* bargraph is normally 'backed off' so that no display is illuminated (this can lead to confusion during demonstrations, when the background smoke level may be high, but the bargraph does not indicate). The bargraph also displays other information during the TEST routine and it gives a special 'rolling' single segment display during the FastLearn™ period.

Test

This button performs a self test on the currently displayed Detection Area (See explanation page 5) and shows alarm levels, performs a lamp test and detector sensitivity. To test a Detection Area, wait for the required Detection Area to be indicated before pressing the 'test' button. (See 'Self Test' for more details on page 14).

Isolate

Pressing the ISOLATE button puts the selected Detection Area 'off line' whereby this sector will not be capable of generating any alarms. This also operates the fault relay so that a fault condition will be registered at the host Fire Alarm control panel for this Detection Area. Press isolate again to put the Detection Area back on line. If all detection areas (pipes) are required to be isolated, each detector area must be isolated in turn.

NB

Note - It is possible to set a 'programmed Isolate' mode, in which the fault condition is not indicated at the Fire Alarm panel. If this has been done then, due to the potential for non indication of a fire condition, if the installer forgets to remove it, a time-out of seven days has been incorporated after which the programmed isolate condition will be automatically removed.

Reset

The RESET button resets any latched alarm or fault relays and takes the unit out of programming mode.

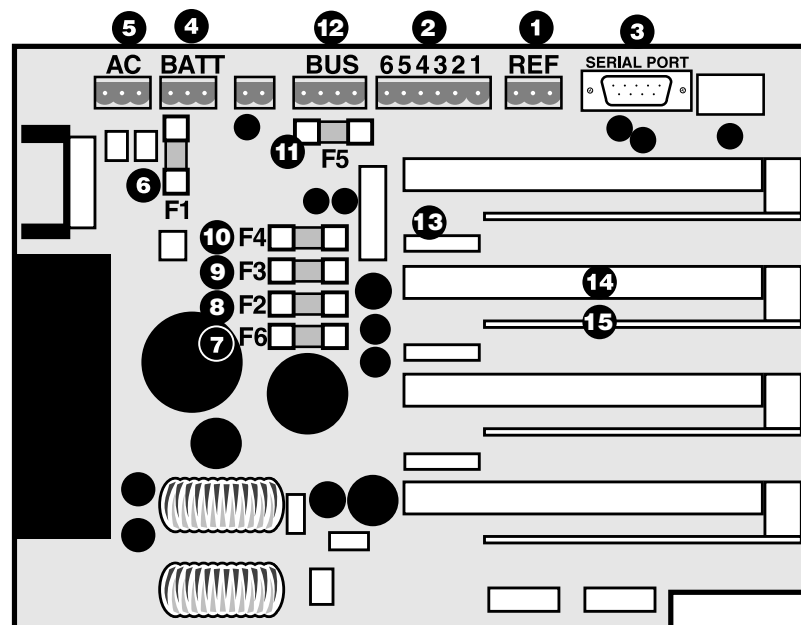
NB

Note - In order to comply with the access requirements of National Standards this control is normally disabled. It may only be operated by entering a security code in the programmer section inside the detector enclosure or by using the Remote Software installed in a PC connected to the Serial Port.

Terminal Board

This board is designed to accept proprietary plug-in addressable modules which are available from various manufacturers. The Stratos-Quadra is capable of giving separate indication and output for each of the four sampling pipes. If this is required, then the Output interface sockets must be connected to a suitable output device or method. It is also possible to use proprietary 'contact' or 'switch monitoring' devices which are available from all addressable equipment manufacturers. In this case the monitoring devices should be connected to the appropriate terminal blocks provided and marked for this purpose on the output interface boards supplied with the detector.

See page 24 for details of the Addressable Interface Pin Connections



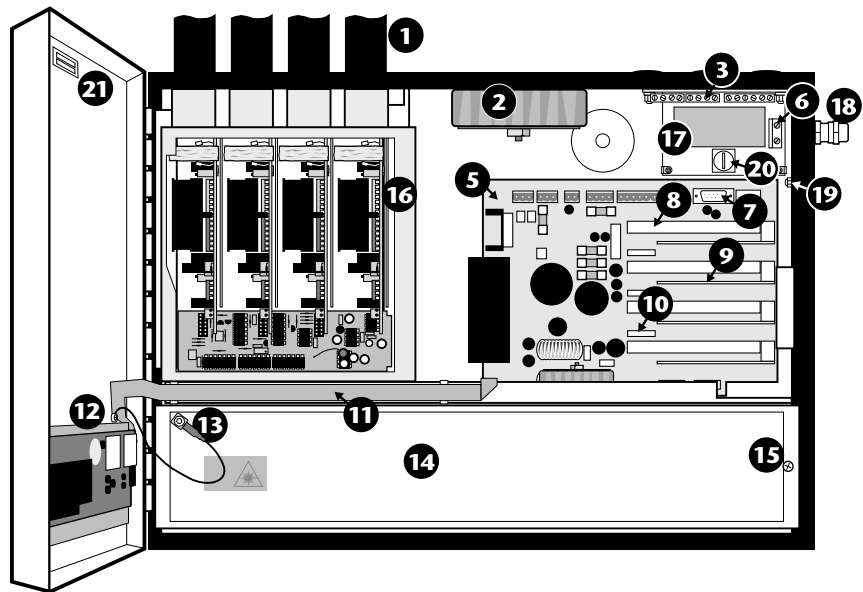
NB

All fuses are 20mm ceramic quick blow type

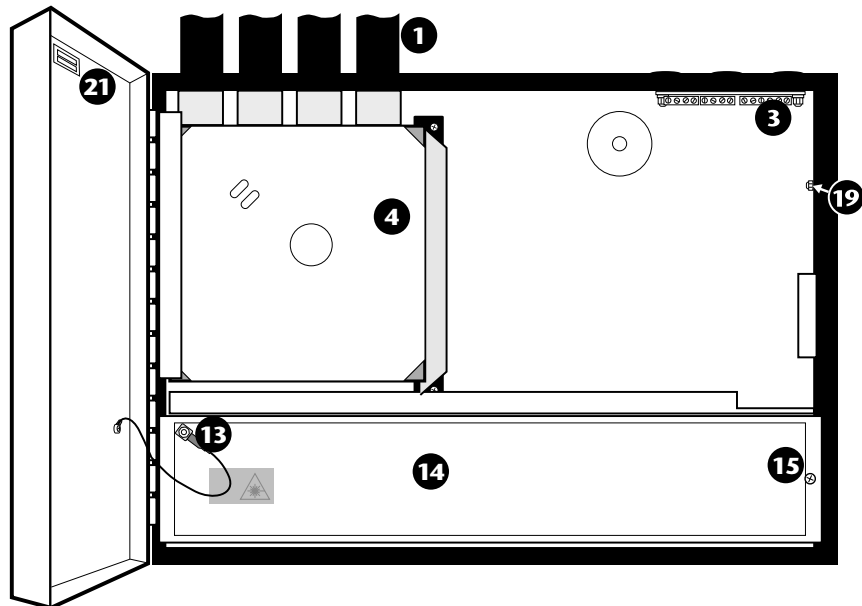
- | | |
|--|--|
| 1. Remote reference connector (<i>optional</i>) | 8. F2 - 12V supply fuse (2 Amp) |
| 2. Addressable loop Input-Output | 9. F3 - 5V supply fuse (2 Amp) |
| 3. RS232 serial port | 10. F4 - 24V supply fuse (8 Amp) |
| 4. 12V Battery connector | 11. F5 - slave loop fuse (3.15 A T-type) |
| 5. Transformer input or external 24 volts DC connector | 12. Slave loop connector |
| 6. F1 - Battery fuse (8 Amp) | 13. Line link board connector |
| 7. F6 - Battery charger supply fuse (4 Amp) | 14. Output interface socket |
| | 15. Relay board |

Stratos-Quadra & Reference detector Internals

**Stratos-Quadra detector
internal view**
(showing micro laser assembly)



**Reference detector
internal view**



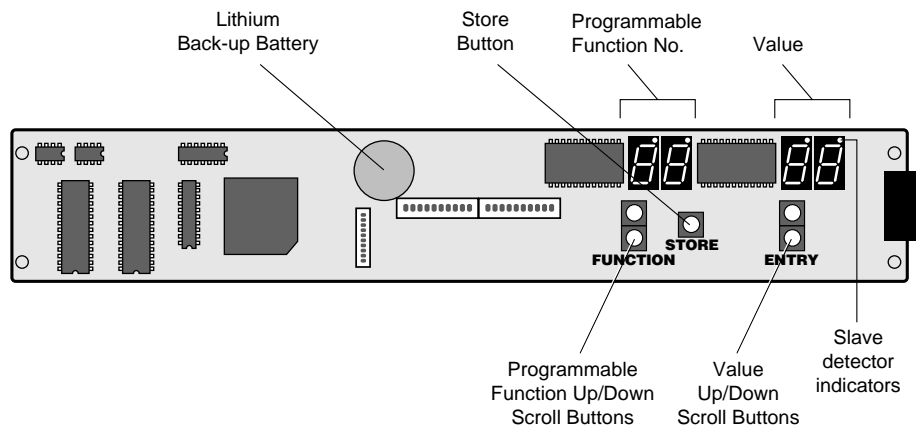
- | | | |
|---------------------------|-------------------------------|-------------------------|
| 1. sampling pipes 1-4 | 8. interface board socket | 15. cover fixing screw |
| 2. mains transformer | 9. relay board | 16. detector assembly |
| 3. terminal block | 10. line-link board | 17. Mains board |
| 4. aspirator | 11. ribbon cable | 18. Power cable gland |
| 5. terminal board | 12. control board | 19. Case earthing stud |
| 6. Power supply terminals | 13. earthing strap | 20. Power fuse |
| 7. serial port | 14. battery compartment cover | 21. Serial number cover |

NB 

In the Reference Detector, the Dust Separator & Laser Detector Chamber are covered by a removable metal plate. This plate must be removed for access to these items. The Reference detector is a 'standard' Stratos-HSSD detector. For specific details please use Stratos-HSSD technical information.

Inside Door Controls

In order to alter the configuration of the Stratos-Quadra unit, it is necessary to open the door of the unit using the special key provided. Attached to the lower section of the door is the programmer display illustrated below:



To operate the internal programmer, depress either of the Programmable Function scroll buttons. This will cause the LED displays to illuminate. The Programmable Function display shows the current function to be programmed. The Programmable Function number is scrolled up or down by the function scroll Up and Down push buttons. The Value display shows the value of the current function being programmed. This may only be altered if the Engineering Access code has been entered. This code may be user programmed, but **factory default is '01' for function 01 and '02' for function 02.**

Pressing the STORE button saves the programmed function value in memory. The Programmable Function and Value displays will flash briefly to show that the value has been accepted.

The programming mode has a time-out after fifteen minutes of inactivity, after which time the display will extinguish and the security code will need to be re-entered if further changes are required. This is to prevent unauthorised alterations to settings.

The LED indicators on the Control Board have decimal points at the top of their displays. These indicators flash sequentially to mimic the indication given on the Detector Area display on the front display. They are used to indicate which detection area (sampling pipe) is being programmed if different values, such as ClassiFire alarm factor, time delays etc. are required for different detection areas.

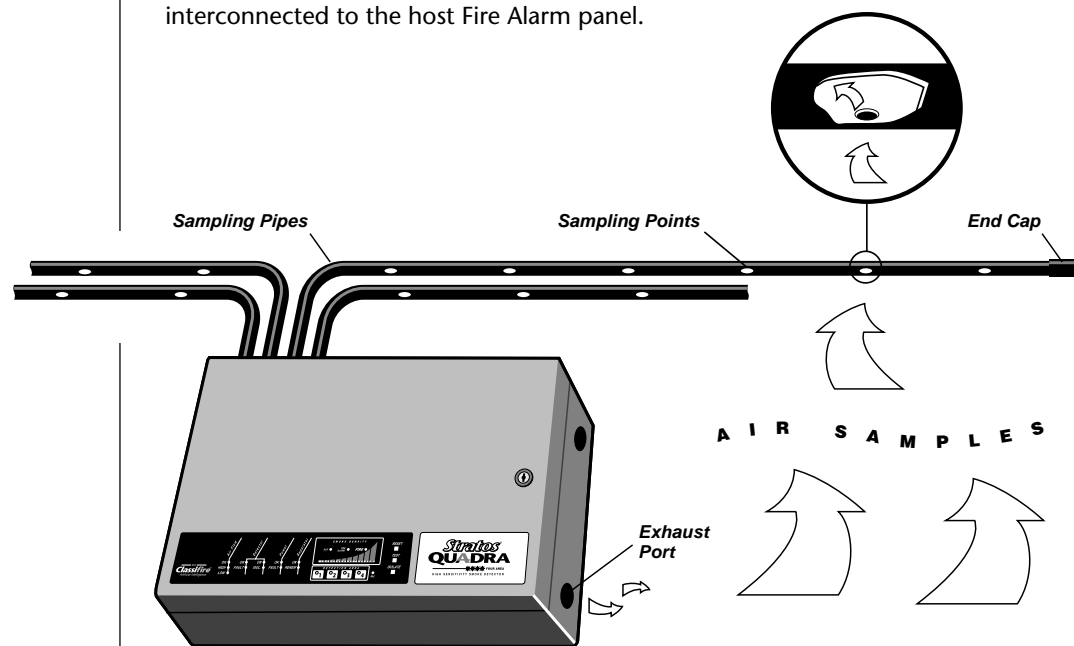
It is sometimes desirable during testing to lock the Detection Area display LED, which will normally be sequentially indicating separate detection areas. This is achieved by pressing the 'ENTRY' up or down keys whilst holding down the 'STORE' key. Each press of the ENTRY key will step one detection area. The locked condition may be removed by either pressing the front RESET key or waiting for the 15 minute time-out. Note that this does not affect detection capability of the system on non-displayed pipes.

Programming Detection Areas with different settings

Locking Display

Installing a Stratos-Quadra system

All Stratos detectors should be installed according to the norms for continually aspirating Smoke Detection equipment. It is not intended to explain fully in this Installers Handbook how to design the sampling pipe arrangement, but this handbook does explain in detail the electrical operation of the system and how it may be interconnected to the host Fire Alarm panel.



The detector cabinet is constructed from sheet steel. Four air inlet ports are provided on the top of the cabinet. As with all aspirating detectors, it is recommended that the detectors are located as close as possible to the protected area and ideally they should be inside it. If this is not possible, and particularly if the detector location is of different air pressure to the protected area or areas, then the exhaust air must be returned through an exhaust pipe to the same pressure zone as the sampled area(s). If this is not done, then sampling performance may be unreliable.

Three mounting holes are provided in the rear of the cabinet for wall mounting. When the detector is securely mounted in position, connect the mains supply. Make the appropriate field wiring connections to the terminals and line links on the terminal board in accordance with the selected fire alarm control panel manufacturers recommendations.

Third-party proprietary addressable units may be connected to the Interface boards provided for this purpose.

Basics of Sampling system Design

Aspirating system design is inherently simple. It is often possible to achieve good system performance with *very* simple installations. There are however a few rules which must be adhered to and these rules are equally applicable to all aspirating systems which operate on similar principles to Stratos-Quadra®. The information contained in this Handbook is intended as an overview only. For further information please see the complete System Design Manual.

1. Do not expect one detector to achieve good performance if sampling from areas of different air pressure (typically: underfloor air plenums and room spaces or different rooms in air conditioned areas). This is because the air pressure differences may cause reverse or poor air flows along the sampling pipes.

2. Always locate the sampling points in a position to which smoke may reasonably be expected to travel. This may sound obvious, but, for example do not expect ceiling mounted sampling points to operate satisfactorily if air flow prevents the cool smoke from an incipient fire from reaching ceiling level. In this instance it is usually better to locate the sampling pipes directly in the air flow (for example in an air conditioning unit air intake). There is no substitute for carrying out smoke tests prior to installation of pipes to indicate suitable sampling point location.

3. If any air handling system is in use, try to locate the detector within the protected space. If this is not possible, then use an exhaust pipe from the detector exhaust port to return the air to the protected space. This will minimise problems created by air pressure acting adversely upon the sampling system.

4. To verify system performance it is advisable to use the AirSense PipeCAD® for Windows computerised sampling pipe modelling package.

Sampling pipes should be made from non-hazardous material and clearly identified.

a. Ideal internal diameter of sampling pipes is 22mm. Other sizes will often work but will usually provide slower response times.

NB 

b. Maximum recommended total sampling pipe length is 200 metres. **Note:** *This is 4 lengths of 50 metres, or 2 lengths of 100 metres.*

c. Sampling pipes must have capped ends. The end cap should be drilled with a sampling hole normally between 4 and 5mm diameter.

d. When using multiple sampling pipes, it is desirable to achieve a reasonable degree of balance (say within 10% of length) to ensure even suction from the pipes. If this is not possible, it is advisable to take particular care in verifying adequate sampling from all sampling points.

ClassiFire[®] Alarm Factor Setting

NB 

Sampling holes should normally be 3-4mm diameter, burr free, and each length of pipe should not have more than 25 holes.

This guide holds true for *average* sampling pipe lengths, but if using long pipes (typically more than 60 metres total), performance may be improved by making the sampling holes near the ends slightly larger than those nearer the detector. Although by no means essential, it must be recommended that if in doubt, PipeCAD[®] be used to ensure that transit times, balance of suction and individual sampling point sensitivity are within desired limits.

LPCB tested pipework to be used for approved installations.

Apart from ensuring that the clock and calendar are correctly set, the most important adjustment to be made by the installer/commissioning engineer is the ClassiFire alarm factor setting. This setting may be different for each pipe/area.

An appropriate ClassiFire alarm factor may be programmed to suit the anticipated environment. The setting of this alarm factor will influence the frequency of nuisance alarms. It will also effect the sensitivity of the detector to unusual smoke densities. The system will automatically maintain its sensitivity level to give a selected probability of a nuisance alarm occurring with normal variations in smoke density. Many factors will influence the selection of the ClassiFire alarm factor, such as cost or inconvenience of a nuisance alarm or the value of the area being protected.

ClassiFire Alarm Factor	Degree of Protection	Probability of Nuisance Alarm
3	High	Once in 5 years
4		Once in 10 years
5	Medium	Once in 15 years
6		Once in 50 years
7		Once in 1,000 years
8	Normal	Once in 5,000 years

Recommended Alarm Factors would be:-

3	Clean room	6	Clean Factory
4	Computer room	7	Warehouse
5	Non-Smoking office	8	Warehouse with diesel trucks operating

When first powered up the detector automatically initiates a 15 minute 'FastLearn™' routine whereby the approximate correct sensitivity for the environment is determined. This is necessary because the detectors used in the system have a very wide sensitivity operating range and they need to determine the appropriate sensitivity for their environment. Therefore a degree of care should be taken to ensure that, when first or subsequently powering up the detector(s), the environment bears a resemblance to that anticipated during normal use.

During the 15 minute FastLearn period, the detector(s) have the ability to vary their sensitivity and alarm thresholds at high speed and during this period the detectors are incapable of generating alarms. At the end of the FastLearn period, the detector(s) will be capable of generating alarms, but will be operating at relatively low sensitivity. They will take a further 24 hours to fully optimise their sensitivity to suit the environment, unless 'demonstration mode' is entered (see page 34).

The ClassiFire system utilises the 24 hour period to determine the optimum sensitivity setting for daytime and night-time periods.

During initial power-up the detector will automatically set the air flow 'high' and 'low' fault thresholds.

Factory default

Setting the detector to its factory default state returns the programmable options to the values even in the programmable function list (see page 15).

The controller then runs diagnostic checks on each Detection Area sector to verify correct operation. During these checks the Detection Area being interrogated is indicated by its front panel 'Detection Area' indicator LED being illuminated.

Diagnostic checks are initiated on the reference detector if connected and, if successful, Local Referencing is automatically enabled.

Self test

The self test can be run at any time by pressing the TEST button on the front panel, provided that the button has been enabled (function 36 page 19) which is not its factory default state.

The self test is in four parts:

- ❶ All of the LED indicators on the front panel are illuminated (lamp test).
- ❷ Detection Area 1 through to 4 have diagnostic checks run on them.
- ❸ Because the display is multi function, each Detection Area is displayed separately and sequentially. Alarm levels for each Detection Area are displayed in the following sequence starting with Detection Area number one:
 - a. The Aux. level is displayed as a single bar graph LED.
 - b. The Pre-Alarm level is displayed as a single bar graph LED.
 - c. The Alarm level is displayed as a single bargraph LED. This is always level 8 and cannot be altered.
- ❹ The actual detector sensitivity in per cent obscuration per metre is displayed on the function and value display (see page 9) on the internal programmer during the test routine.

Programmable function listing

Function No.	Description	Possible Values	Default Value	Notes
1	Engineering code part 1	00 to 99	—	1
2	Engineering code part 2	00 to 99	—	1
3	Factory default set up values	'y' or 'n'	'y'	
4	Number of Detection Areas required	01 to 04	04	7
5	Local reference enable	'y' or 'n'	—	7
6	Remote reference enable	'y' or 'n'	'n'	7
7	Reference level	00 to 99	00	4
8	Reference back off time (minutes)	00 to 99	15	4
9	FastLearn™ enable	'y' or 'n'	'y'	6
10	Pre-alarm level	03 to 08	06	4
11	Aux level	02 to 10	10	4
12	Alarm delay in seconds	00 to 60	05	4
13	Pre-alarm delay in seconds	00 to 60	05	4
14	Aux delay in seconds	00 to 60	05	4
15	Customer default save	'y' or 'n'	'n'	
16	Customer default restore	'y' or 'n'	'n'	
17	Time: Hour (24 hour format)	00 to 23	12	8
18	Minutes	00 to 59	00	8
19	Date: Day	01 to 31	01	8
20	Month	01 to 12	01	8
21	Year	00 to 99	92	8
22	Battery check enable	'y' or 'n'	'y'	
23	Mains check enable	'y' or 'n'	'y'	
24	Low airflow fault threshold	00 to 99	—	4,7
25	High airflow fault threshold	00 to 99	—	4,7
26	Airflow rate	00 to 99	—	4,5
27	Latching alarms enable	'y' or 'n'	'n'	
28	Remote reset enable	'y' or 'n'	'n'	
29	Cascading alarms	'y' or 'n'	'y'	
30	Time delay override	'y' or 'n'	'n'	
31	User defined engineering access code part 1	00 to 99	01	2
32	User defined engineering access code part 2	00 to 99	02	2
33	Hour start of day operation	00 to 23	08	4
34	Hour start of night operation	00 to 23	19	4
35	ISOLATE button enable	'y' or 'n'	'n'	
36	TEST button enable	'y' or 'n'	'y'	
37	RESET button enable	'y' or 'n'	'n'	
38	Alarm factor for ClassiFire™ function	03 to 08	04	4
39	ClassiFire® override (% of signal)	00 to 99	00	4
40	Remote Isolate enable	'y' or 'n'	'n'	
41	Programmed Isolate mode	'y' or 'n'	'n'	
42	Aspirator speed (1 = low 10 = high)	01 to 10	05	
43	Watchdog trip count	00 to 99	00	5
44	Histogram print	'y' or 'n'	'n'	3
45	Event log print	'y' or 'n'	'n'	3
46	Firmware revision	00 to 99	Current	
47	Chart log recording rate	0 to 5	5	
48	Fault latch enable	'y' or 'n'	'y'	
49	Remote mimic enable	'y' or 'n'	—	7
50	Power save enable	'y' or 'n'	'y'	
51	Dust separator condition	80 - 99	—	4
52	Auto FastLearn™ enable	'y' or 'n'	'y'	
53	LDD™ enable	'y' or 'n'	'y'	
54	Remote day/night	'y' or 'n'	'n'	

NB 

❶ The factory default user defined access code is 01, 02.

NB 

❷ The user defined access code can only be viewed when a valid access code has been entered in Functions 1 and 2.

NB 

❸ Pressing store with 'y' selected causes an immediate print out of the histogram or event log, followed by the selected Function being automatically reset to 'n'. These Functions cannot be changed when the histogram viewer mode is operational.

NB 

❹ These entries can have a separate value for each detection area. The value for an area is displayed when its front panel indicator is illuminated. This is duplicated on the function digital read-out.

NB 

❺ This value is for display purposes only and cannot be modified.

NB 

❻ Setting this function to 'y' (yes) will start a Fastlearn for fifteen minutes after which the function will be reset to 'n' (no).

NB 

❼ The: Number of detection areas supported by the unit, local reference detector enable, remote reset enable, remote mimic enable and flow limits are all automatically set to the value that the unit detects when the controller is reset to factory defaults. See factory default (page 13) for more details.

NB 

❸ These values are reset when the RAM contents are cleared, e.g. when the software chip is replaced.

Programmable functions in detail

Function 1 & 2 - Engineering access code

Before any of the operating parameters of the system can be modified, the user must first enter an engineering access code. If this code has not been entered, the user may scroll through the functions and view the settings, but cannot modify them.

Function 3 - Factory default

This function has two purposes. If any function of the controller has been changed by the user, this function will display 'n', indicating that it is not at factory default. Setting this function to 'y' will set the controller to factory default: See 'Factory Default' (page 13) for more details.

Function 4 - Number of detection areas

This value is set to the number of **detection areas** found when the controller was set to factory default: See 'Factory Default' (page 13) for more details.

Function 5 - Local reference enable

A local reference detector is a reference detector which is connected directly to the controller's bus interface. This function is set to the appropriate value when applying factory default: See 'Factory Default' (page 13) for more details.

Function 6 - Remote reference enable

Remote reference enable is used when a reference detector that is connected to another detector controller's internal comms system is used for an input reference signal. The reference signal is output to other controllers via a two core screened cable. In this way a single reference detector may be used to reference multiple Stratos-Quadra detector controllers (see item 1 - page 7). *FOR FURTHER INFORMATION ON SIGNAL REFERENCING PLEASE REFER TO THE TECHNICAL MANUAL.*

Function 7 - Reference level

This function has a separate entry for each detection area. The value entered is the percentage of reference signal by which the detector will be offset, when a reference detector is used.

Function 8 - Reference back-off time delay

This function has a separate entry for each detection area. The back-off is the time, in minutes, that it takes for the reference level to decrease to zero for a zero signal level. This is of use if, as is normal, the smoke density in a protected area takes some time to increase or decrease after deviating from normal levels.

NB 

Important Note

NB 

NB 

Function 9 - FastLearn™ enable

Setting this function to 'y' will start a FastLearn. The bargraph display on the front of the detector will show a rolling segment for the fifteen minutes it takes to complete this routine. The *Value* display on the internal programmer will indicate the number of minutes of FastLearn remaining during this operation. **Note:** It will take a further 24 hours for full sensitivity to be reached, unless Demonstration Mode (see page 34) has been initiated.

Functions 10, 11 - Alarm levels

These functions have a separate entry for each detection area. The value set in these functions is the bargraph level at which the appropriate alarm is initiated. **Note:** Aux. alarm is factory set at level 10 which means that this alarm will occur after FIRE signal.

Functions 12, 13 & 14 - Alarm delays

These functions have a separate entry for each detection area. The delay is the number of seconds that an alarm level has to be continuously sensed before the alarm is initiated.

Functions 15 - Customer default save

Setting this function to 'y' will save all current settings for later recall by operation of function 16. When the detector has been installed, the customer's configuration can be stored for recall if the configuration has subsequently been changed.

Functions 16 - Customer default restore

Operation of this function restores programmable values from previous operation of function 15.

Functions 17, 18, 19, 20 & 21 - Time and date

It is important that the time and date be set up correctly on the controller's internal calendar/clock because it uses this information to perform day/night switching. The current date and time is also read from the clock when an event occurs: See 'Event Log' (page 23) for more details. Unless specially ordered, detectors are supplied set to UK time. This is backed up with a long life lithium battery. Later adjustments to the clock setting should not exceed ± 70 mins unless a FastLearn is initiated to ensure day/night switching is set up correctly.

Function 22 - Battery check enable

If no battery back-up is required, this function should be set to 'n' (no) to avoid POWER FAULT being displayed on the front panel.

Function 23 - Mains check enable

When using detectors with an external 12 or 24 Volt power supply this function should be set to 'n'.

Functions 24, 25 & 26 - Airflow monitoring

These functions have a separate entry for each detection area. The high and low airflow fault thresholds are automatically set up on initial power-up to be correct. The fault thresholds may be manually adjusted if required. Function 26 is used to display the airflow rate and cannot be changed: See 'Factory Default' (page 13) for more details.

Function 27 - Alarm latch enable

When this function is set to 'y' (yes) it requires a Reset on the front panel or a remote reset to clear an alarm condition.

Function 28 - Remote reset enable

If remote resetting of the detector is required from the host Fire Alarm controller, this option must be set to 'y' and the Remote Reset circuitry must be fitted to the detector.

NB 

Note: Only one of Functions 28, 39, 40, and 54 may be enabled.

Function 29 - Cascading alarms

Setting this function to 'y' means that only when the controller has gone into pre-alarm does the controller start counting down the main Fire delay.

Function 30 - Time Delay Override

If this function is set to 'y' (yes), then the detector will ignore any preset time delays in the event of an unacceptably rapid increase in smoke density, thereby minimising response time to 'rapid growth' fires.

Functions 31 & 32 - User defined access code

NB 

The values in these two functions are the access code that the user has to input in order to modify any of the Function values. **Note** - When scrolling through Function values, if the access code has not been input, this Value display will be blank.

Functions 33 & 34 - Hour start of day and night operation

These values are the times to the nearest hour at which the day/night switching is desired to take place. Entries are made in 24 hour format, e.g. 19 for 7pm. If no day/night switching is required, then both entries should be set to '00'.

Functions 35, 36 & 37 - Reset, Test & Isolate button enable/disable

The front panel buttons may be enabled or disabled individually using these functions.

NB 

Function 38 - ClassiFire[®] alarm factor

The probability of nuisance alarm is set with this entry. 3 = high sensitivity, high probability, 8 = lower sensitivity, lower probability. (see page 12) **Note:** 'High' sensitivity cannot be achieved unless ClassiFire alarm factor 3 has been set.

NB 

Function 39 - ClassiFire override

When this function is set to a value other than zero, the connection of 'Reset' (Pin 21 on universal interface card - see page 25) to 0V (Pin 26) will desensitise the detection area by the specified amount in percentage terms. The remote reset circuitry must be fitted for this facility to operate. **Note:** Only one of Functions 28, 39, 40 and 54 may be enabled.

NB 

Function 40 - Remote Isolate Enable

When this function is set to 'y' a remote switch may be used to isolate the detection area. The remote reset circuitry must be fitted for this facility to operate. **Note:** Only one of Functions 28, 39, 40 and 54 may be enabled.

Function 41 - Programmed Isolate

When set to 'y' the detector will not generate alarms and will not indicate a fault condition to any fire panel which is connected. The ISOL. LED will be lit on the detector display. The isolated condition will be disabled automatically after 7 days.

Function 42 - Aspirator speed

The value entered sets the aspirator at a fixed speed. Lower numbers denote a lower airflow rate.

Function 43 - Watchdog trip count

The watchdog is a circuit built into the controller that restarts the controller in the event of a failure to function properly. This could be as a result of electrical spikes. This count is for display only and cannot be modified.

Function 44 - Histogram print

Setting this function to 'y' prints the histogram in numerical format to a serial printer connected to the detector serial port. The display will default to 'n' when printing is finished.

Function 45 - Event log print

To print out the event log to a serial printer which may be connected to the detector serial port, set this function to 'y'. It will default to 'n' when printing is finished.

Function 46 - Firmware version

This function displays the firmware version of the detector. This value is for display only and may not be changed.

Function 47 - Chart log recording rate

This function controls how frequently the output from the detector is stored in the internal chart recorder log. The recording rates per division of the chart log are as follows: **0** = no recording. **1** = 10 sec. **2** = 1 min. **3** = 10 min. **4** = 50 min. **5** = 200 min. (factory default). At the slowest recording rate, one weeks worth of data can be recorded for all four detection areas. A PC must be connected via the RS232 port with appropriate software to view the chart recorder log.

Function 48 - Fault latch enable

When this function is set to 'y' it requires a Reset from the front panel or a remote reset to clear latched faults. This is the factory default setting.

Function 49 - Remote mimic enable

This function must be set to 'y' when using the detector with the optional remote mimic display.

Function 50 - Power save enable

This function allows the detector to minimise electrical power consumption when operating from stand-by batteries. If enabled, upon mains supply failure the aspirator will reduce speed and the indicator lights will reduce in brightness. **Note** - Any increase in smoke reading above 3 bars will automatically remove this condition.

NB 

Function 51 - Dust separator condition

The value given at this function is the efficiency rating of the dust separator element. A new element will display '99'. When the efficiency has decreased to '80', the Dust Separator Renew indicator LED will illuminate. **Note: this value may be different for each detection area if the environment is different in each area. Fitting a new element will reset this figure to 99.**

NB 

Function 52 - Auto FastLearn Enable

Setting this function to 'n' disables the FastLearn on initial Power-up. The detector area calibration/sensitivity setting from the previous operating period will be used.

Function 53 - LDD™ Enable

Laser Dust Discrimination (LDD) increases the response time of the detector slightly. LDD may be disabled in clean rooms for faster response to smoke.

Function 54 - Remote day/night

Using this function the detector can be switched between day and night mode using the remote reset input. **Note: Only one of Functions 28, 39, 40 and 54 may be enabled.**

NB 

Connection to a Computer

All Stratos-Quadra[®] master detectors incorporate an inbuilt serial port. This connector, which conforms to the IBM PC/AT standard, has four uses. Firstly, it may be used for data printouts to a serial printer. It may be used for connection to a PC for remote programming and setup. It may be used to perform diagnostic checks and viewing of historical event logs etc.

The serial port may be connected to a standard modem for access from a remote site.

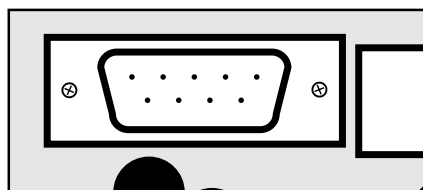
Using the software supplied with the detector, any PC or compatible can be connected to the controller.

If using MSDOS, to run the software type 'QUAD' at the DOS prompt. At this point pressing the 'RETURN' key causes the detector controller to go into remote mode and display the log-on screen. Pressing the 'ESCAPE' or 'ESC' key at any time will exit remote mode and return to the DOS prompt. To log-on, type the user Engineering access code as a four digit number when prompted. Successfully entering this code number brings up the main menu screen from which the controller can be set-up; diagnostics can be run, or various graphical displays of status information can be displayed.

Alternatively the Windows based Remote software may be used. This is compatible with version 3.1 upwards of the Windows operating system. The Windows Remote software offers superior features compared to the MSDOS version.

The remote mode has a time-out of five minutes of inactivity or, alternatively, pressing the 'RESET' key on the detector front panel ends the remote connection.

See page 34 for details of the Serial Port Connections.



Serial Port on Interconnection board

Event Log

An event is defined as operation of any of the front panel controls (when enabled) or a detection area level exceeding the AUX., PRE-ALARM or FIRE thresholds. The event log will also store items such as day and night start times, Intermediate learn override (demonstration mode), power fault, detector fault etc. The detector keeps a log of the last 100 events for reference purposes.

The event log can be viewed or printed using a PC which has been installed with the standard software and is connected using a serial cable.

The event log can be printed out to any Serial device by using Function 45, which prints out the event log in reverse order i.e. the last recorded event is printed out first.

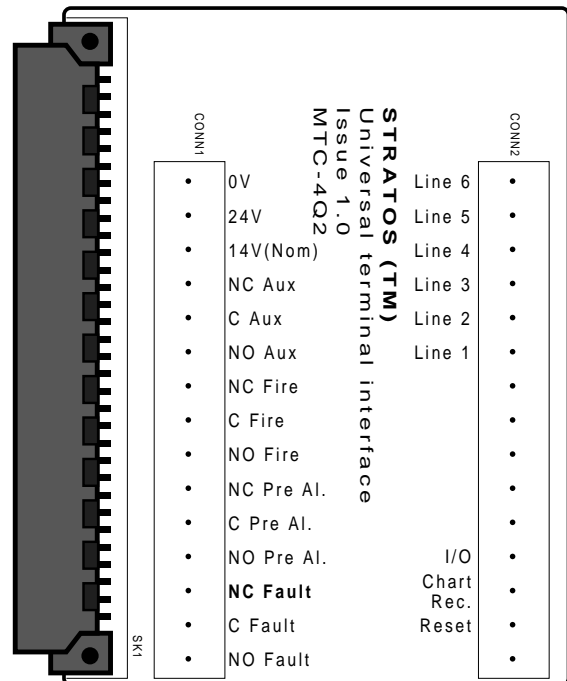
When the buffer that stores events is full (more than 100 events) and a new event occurs, the oldest event in the buffer is discarded (First-In, First-Out).

The information stored with each alarm event is detailed below.

Information	Description
Time	the time the event was first detected in (24 hour format)
Detector	the number of the detector area reporting the event
ALARM time	the time the level was at or over the ALARM level
PRE-ALARM time	the time the level was at or over PRE-ALARM
AUX. time	the time the level was at or over AUX
ALARM level	the ALARM level at the time of the event
PRE-ALARM level	the PRE-ALARM level
AUX. level	the AUX. level

Universal Plug-in Terminal Interface Board Connections

The Universal Terminal Interface Board can be used to connect proprietary Addressable Interface Units to the Detector Area outputs.



Interface Board Pin Table

*These are Volt free relay contacts. The designation 'Normally Closed' and 'Normally Open' refer to the relay coil being non-energised.

NB

Note - In normal operation (i.e. no fault) the fault relay is energised, hence the 'Fault Normally Closed' contact is open.

Pin	Signal	Direction
1*	Fault normally closed	output
2*	Fault common	output
3*	Pre Alarm normally open	output
4*	Pre Alarm common	output
5*	Fire normally open	output
6*	Fire common	output
7*	Fault normally open	output
8*	Pre Alarm normally closed	output
9*	Fire normally closed	output
10*	Aux common	output
11*	Aux normally open	output
12*	Aux normally closed	output
13	unused	-----
14	14 Volt unregulated	output
15	Committed	-----
16	24 Volt regulated	output
17	unused	-----
18	unused	-----
19	unused	-----
20	unused	-----
21	Remote reset	input
22	Bar Graph/Chart Recorder	output
23	unused	-----
24	unused	-----
25	Committed	-----
26	0 Volts	output
27	Line 1	-----
28	Line 2	-----
29	Line 3	-----
30	Line 4	-----
31	Line 5	-----
32	Line 6	-----

Universal plug-in interface board

In the majority of applications the detector will be required to signal Pre-alarm, Alarm and Fault to a fire control panel. Sometimes it will be required to power dedicated alarm bells, relays or other equipment. A wide variety of possible configurations is catered for by the Universal plug-in interface board and the three blocks of 18 point Line Links on the Terminal/PSU board.

The wiring arrangement shown on page 27 shows how the Universal plug-in interface board is connected to the terminal block. There are three sets of Line Links on the Terminal/PSU board for interconnecting up to four detectors (1 x Master and 3 x Slaves) to the six output lines. The required connections are made by connecting header pin links between these pads. Where no configuration has been specified at time of ordering the detector, it will be delivered with none of the links made. Links must be placed in order to obtain any connection between the Universal plug-in board and the connection to the line terminal block. In addition to this there must be circuitry on, or connected to the Universal plug-in board to place the necessary conditions on the lines to suit the control panel used. The following information is intended to indicate how to customise the detector to suit a specific application.

Where an Apollo addressable interface between the detectors and the lines is required, a purpose made board to replace the Universal plug-in unit is available.

Signals and voltages available on the Universal Interface plug-in PCB.

0 Volts

This is the reference for all signals and voltages. It must not be connected directly to earth or the unit's metal work.

24 Volts

In the normal power configuration (mains supply with 12 volt back-up battery), this voltage is made available at all times for driving 24 Volt components such as sounders and beacons. Its capacity is 500 mA. max. **Note:** For LPCB approved installations this supply must not be used.

NB 

14V (Nom)

This is the 'raw' DC voltage from which all regulated voltages are obtained. It may be used, but bear in mind that it is unregulated. With the standard internal power supply the maximum current which may be taken from this will depend upon the number of slave detectors being supplied. This will be 0.5 amps if there are three slaves and 2.0 amps if there are none. If an external 24 Volt power supply is used it will be this external power supply voltage less 2 volts (22 volts). In these instances the nominal '14V' voltage may be as high as 30 volts.

NC, C, & NO Aux.

These are volt free relay change over contacts which connect C to NO when an AUX. level is signalled by the detector. They connect C to NC when AUX. level is not signalled by the detector. *All Alarm and Fault relays contact ratings are 1A @ 24VDC. and they are proof against 500 volt spikes, unless specially ordered. 'Normally Closed' and 'Normally Open' applies to the non energised condition.*

NC, C, & NO Fire.

These are volt free relay change over contacts which connect C to NO when a FIRE level is signalled by the detector. They connect C to NC when FIRE level is not signalled by the detector.

NC, C, & NO Pre-AL.

These are volt free relay change over contacts which connect C to NO when a PRE-ALARM level is signalled by the detector. They connect C to NC when PRE-ALARM level is not signalled by the detector.

NC, C, & NO Fault.

These are volt free relay change over contacts which connect C to NC when a GENERAL FAULT CONDITION is signalled by the detector. They connect C to NO when there is not a GENERAL FAULT CONDITION signalled by the detector. **Note that the operation is the reverse to the other relays, in order to provide 'fail safe' operation.**

I/O

Reserved for future use.

Chart Rec.

This is the output of a six bit D-A converter. It gives a pseudo linear output of 0 to 10 Volts proportional to the bargraph display. A Detector Fail will be indicated by a 0 Volts output.

Reset

Connecting this input to 0 Volts is equivalent to pressing the front panel RESET button. This facility is only available if specifically requested when ordering, as it requires additional circuitry to be installed.

Bargraph

Not to be used. For factory test and set up only.

LINE 1 to LINE 6

These are the terminations connected to the terminal block. (see diagram & description page 32). The examples, illustrated on page 28, show board configurations for common installations.

Example 2 (page 28).

Straight multi-detector zone. All the connections are isolated from the detector internal supplies.

This is to work in a conventional (non-addressable) system where Alarm and Fault are signalled to the control panel by drawing different currents from the 18 Volt zone lines. Alarm signal current is greater than 40 mA. Fault signal current is 15 mA. +/- 2 mA.

Example 3 (page 28).

The detector is driving an external relay. Due to the limited power switching capabilities of the detector output relays, this may be required for the switching of greater current.

The example shows an external (mounted outside the detector) 24 Volt relay powered from the detector power supply. The connection of line links 1 & 2 bring out the relay connections on Line 1 and Line 2 and the board wiring

powers the relay when the Auxiliary level (programmed separately) has been reached.

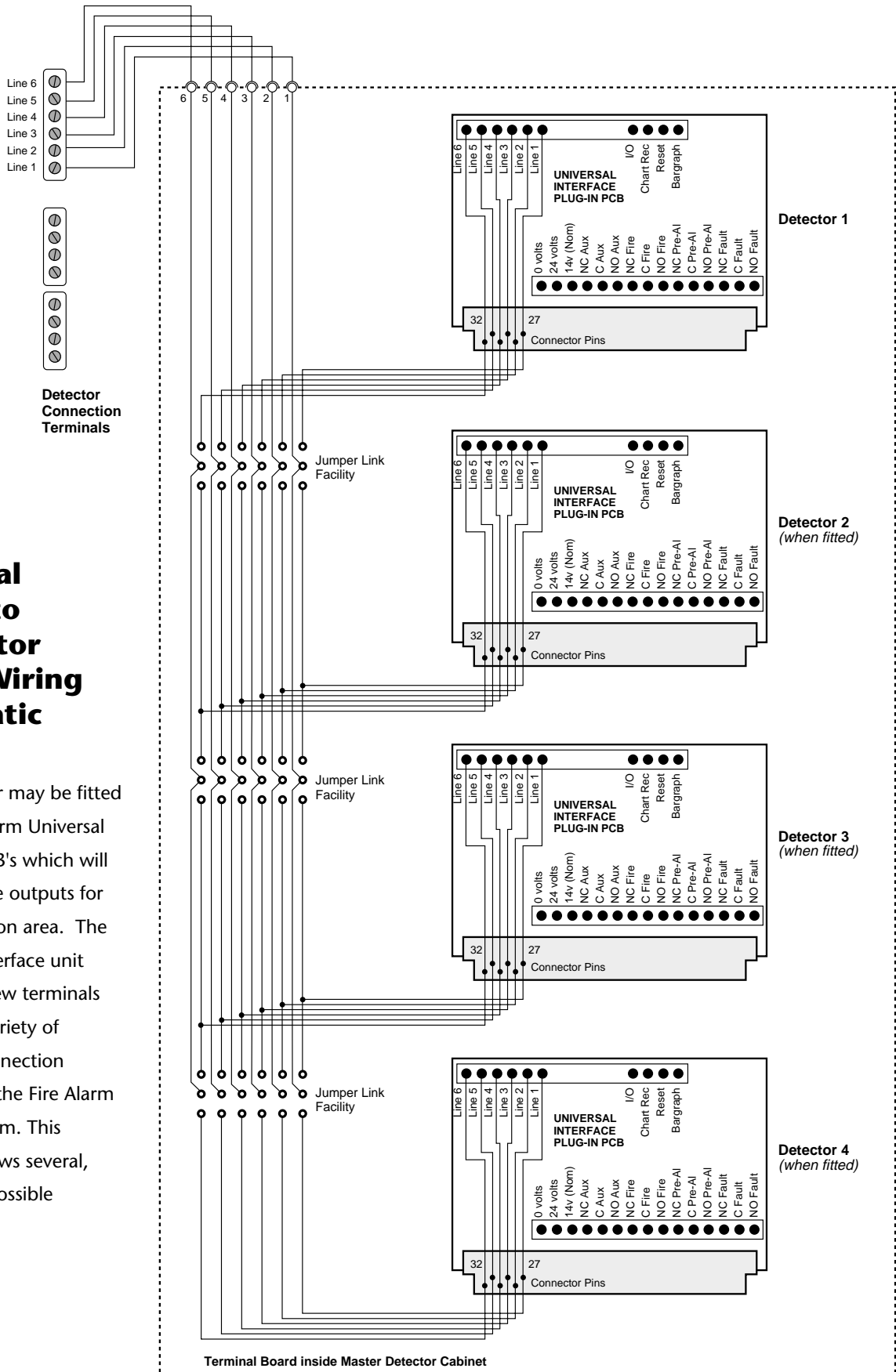
Example 4

The Line Links shown on page 28 bring out connections on Lines 2, 3, 4, 5 & 6. The interface unit is assumed to contain its own pull up resistors on the inputs and the true condition to be signalled by pulling the input down. This may be varied to suit the specific addressable interface.

The Line number connections in these examples have been chosen at random and may be varied to suit the application by altering the Line Links and, for examples 1 & 2, keeping the board as shown.

Terminal Board to connector block Wiring Schematic

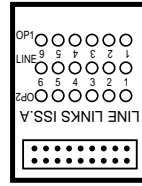
The Detector may be fitted with four alarm Universal Interface PCB's which will give separate outputs for each detection area. The standard interface unit contains screw terminals to allow a variety of different connection methods to the Fire Alarm control system. This diagram shows several, but not all possible methods.



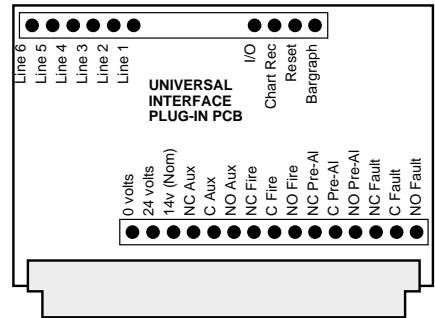
Examples of Connector Methods

1

No lines connected



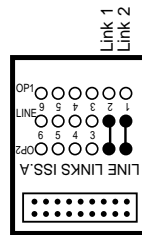
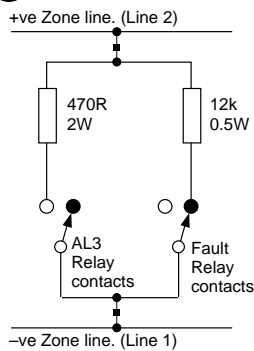
Line Links Board
Connections



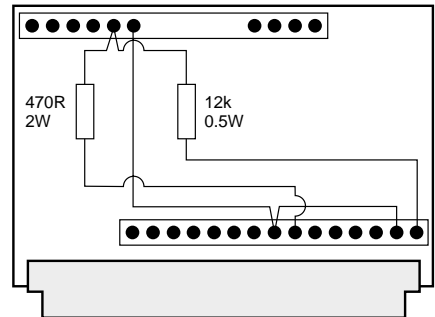
Interface Board Connections

2

Straight multi-detector zone



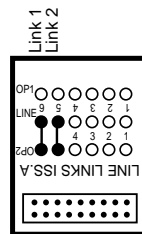
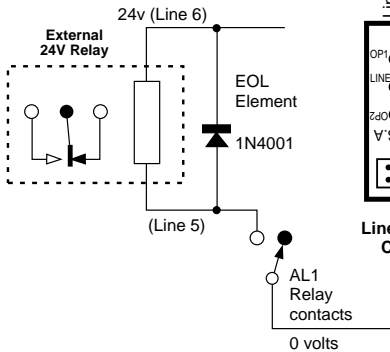
Line Links Board
Connections



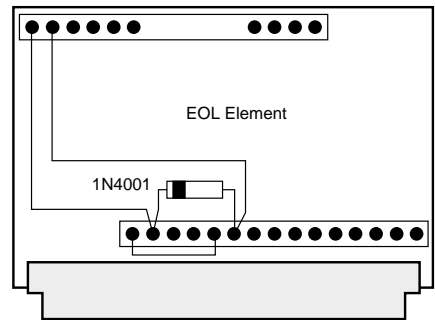
Interface Board Connections

3

Driving external relay



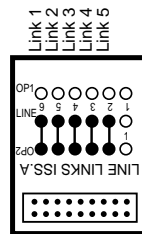
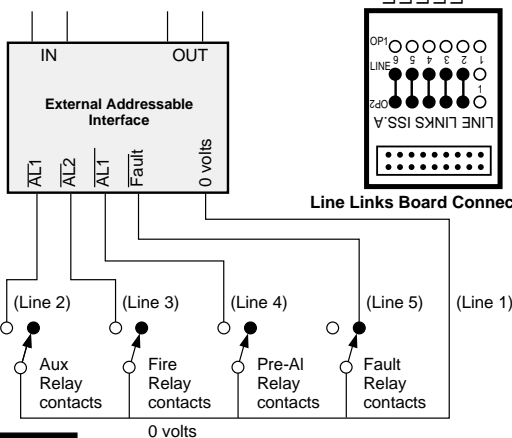
Line Links Board
Connections



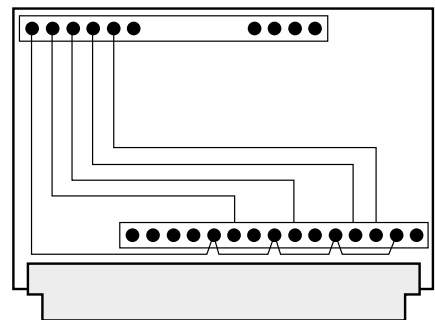
Interface Board Connections

4

Using an external addressable module



Line Links Board
Connections

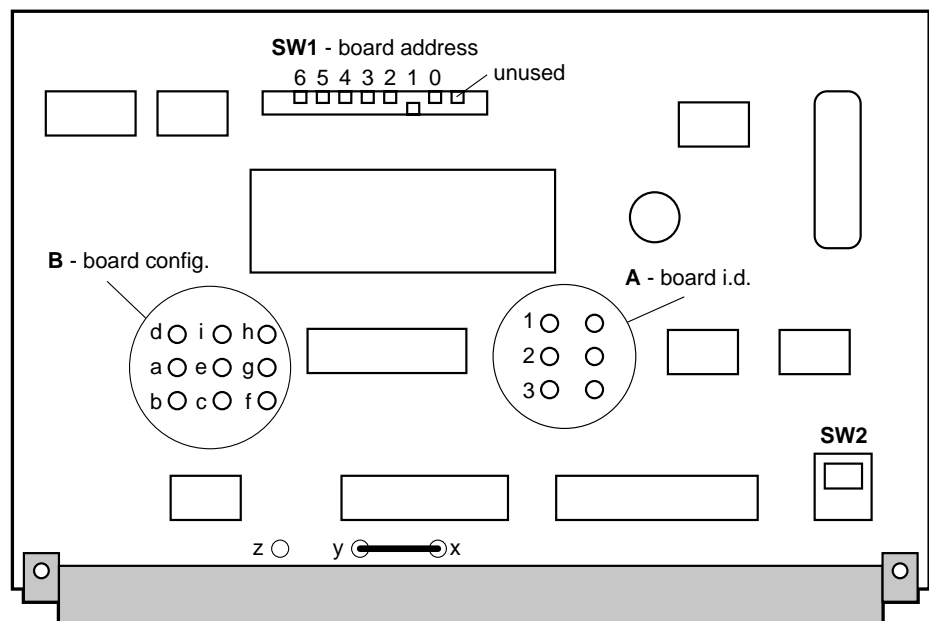


Interface Board Connections

**Apollo Series 90
& XP95
Interface card
set-up**

The layout of the Apollo interface card is shown below. One card per detection area is installed up to a maximum of four. The board is highly configurable and can be set up to emulate any type of Apollo detector.

The board is powered from the *Stratos-Quadra*, not the Apollo line. This means that the detector must be powered-up for the Fire Alarm Panel to 'see' the interface.



Switch SW1 sets the card's address on the Apollo loop. Each card must have a unique address, bits are marked on the board. The board shown has its address set to 2.

Switch SW2 sends the scaled analogue value of the bargraph back to the Fire Panel when the switch is in the down position. Optional circuitry must be fitted at time of order if the analogue value is to be used. For more details on the chart recorder output that is used to generate this analogue value see *Stratos-Quadra*® full Technical Manual. When SW2 is in the up position (as shown), only four pseudo analogue levels are sent; 32 for normal operation, 2 for Fault, 48 for Pre Alarm and 64 for Fire.

The area marked 'A' are the board identification links. Using these links the board can return an identifier to the Fire Panel of any type of Apollo detector. To set a link the numbered pad must be connected horizontally to the pad on its right. The link settings to return an identifier for various detectors are displayed on page 30 overleaf.

Links x, y and z set whether all faults or just head faults are reported back to the main panel. The board is factory set to report all faults. Contact AirSense Technology if this facility is to be changed from its default setting.

Detector Identification	Link Settings
Optical smoke monitor	Link 2 across
Ionisation smoke monitor	Link 1 across
Remote interface unit	Link 1 and 3 across

The area circled and marked 'B' are the board configuration links. These may be set to give added status signals between detector and the fire panel.

Pad	Direction	Use
a	From detector	Auxiliary relay output
b	From detector	Fault
c	To detector	Remote reset
d	To panel	Input bit 0
e	To panel	Input bit 1
f	To panel	Input bit 2
g	From panel	Output bit 2
h	From panel	Output bit 1
i	From panel	Output bit 0

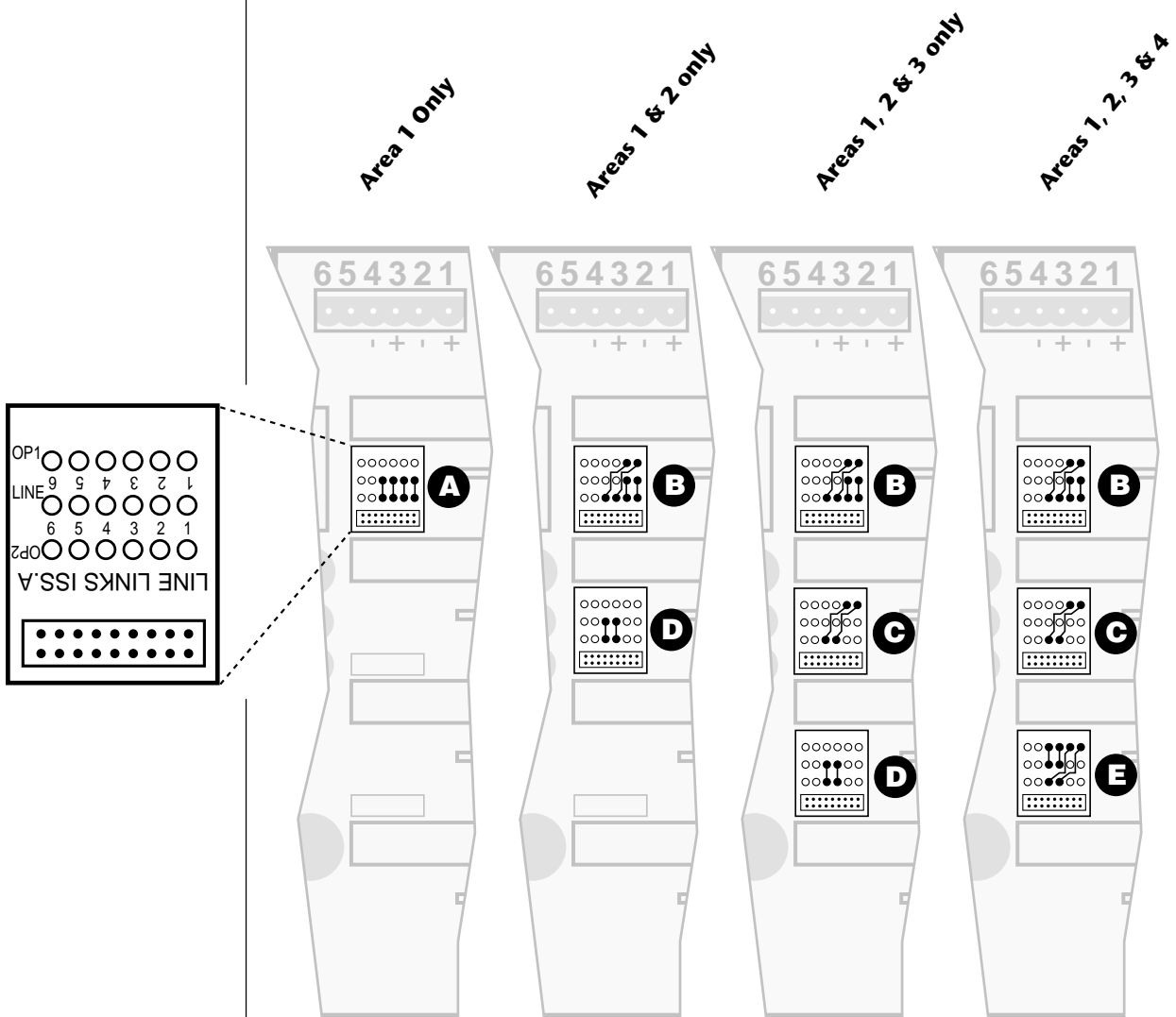
As an example; to drive the detector remote reset line from output bit 0 from the fire panel link 'i' to 'c'. Connect only one signal at a time from connections d - i to a - c.

As shipped the default settings for the Apollo board are:

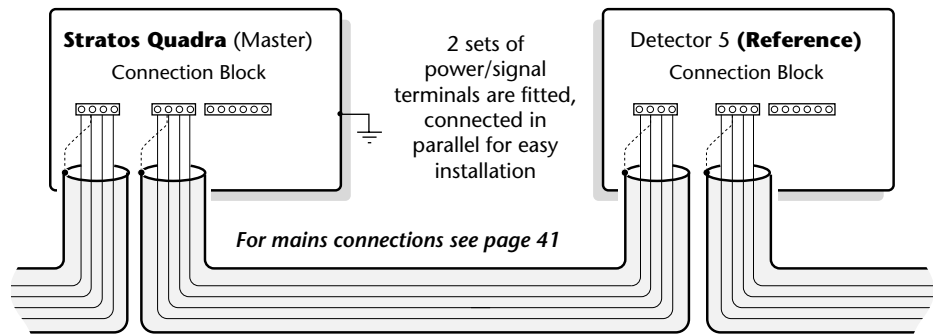
Board i.d.	board config.	fault reporting
Optical smoke monitor	none	all faults
link 2 made	no links	y linked to x

Terminal Board Line Link Connections (for Apollo Interface Card)

In order that the Interface Boards can signal Alarm or Fault conditions correctly at the Detector Terminal Block when used with an addressable type Control Panel, it is important that 'line links' are made in the appropriate positions. The following illustration shows the position and connection details of the Line Link boards on the main Terminal Board.

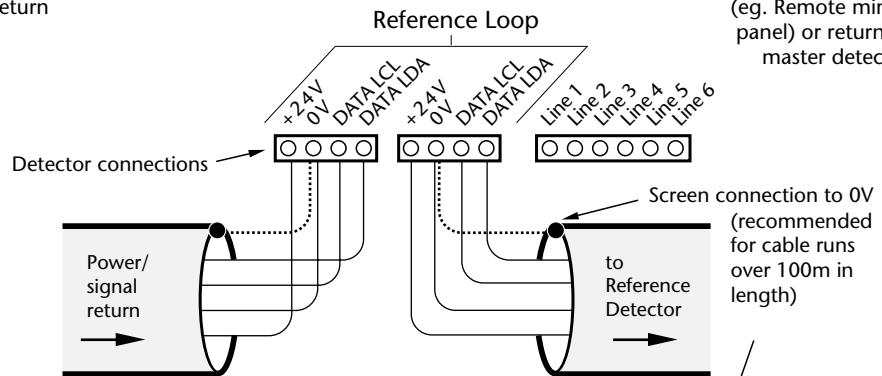


Stratos-Quadra Reference Connection Schematic



Power/signal return

Any further Units (eg. Remote mimic panel) or return to master detector



Important Notes On Interconnection Cables

Example of suitable reference loop cable type within UK

- Pyrotex MICC Type CCM4L1.5
4 Core, 1.5 mm or direct equivalent

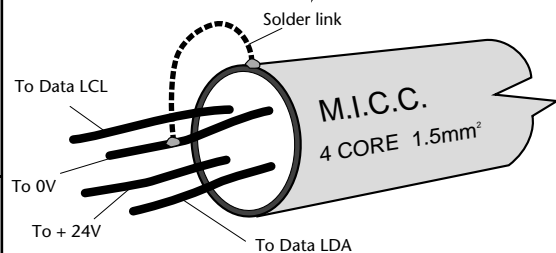
Where non fire proof reference loop cable is used outside UK

- All cables must be screened type.
- Maximum capacitance conductor to screen is 120 pF (picofarads).
- Minimum cross sectional area of reference loop conductors is 1.5mm².

Reference loop cables

- For cable runs of over 100m it is recommended that the overall screen is connected to 'Reference Loop 0V' and the detector case at each detector.
- Cable joints are not permitted.
- Only the Master detector may be connected to mains earth.
- To ensure proper connection it is advisable to use identification tags or sleeves at each end of a connection cable to avoid confusion in a complex system

Maximum total cable length is 200 metres



Use **diametrically opposed** pairs as shown for the Power and Data conductors. This minimises 'crosstalk' and will ensure maximum reliability for the reference/mimic connections.

Mimic Repeater Display & Connections

Description

The mimic display for the detector consists of a self contained 2U high 19 inch rack mounting board upon which all of the detector front panel indicators are duplicated. Mimic controls consist of RESET, TEST and ISOLATE keys and these can be individually enabled or disabled as set for the master detector.

More than one mimic may be used per detector. Since the indicators on the mimic are the same as for the detector display they will not be covered in detail here other than to explain that the mimic can display information for up to a maximum of 4 detection areas and a reference detector.

The mimic panel is connected to the detector data bus using the same four core screened cable as a reference detector would use. It receives all of its power from the Stratos-Quadra unit. The mimic display also supports Power conservation mode, when all of the indicators dim to less than half brightness when the detector is running on battery backup supply.

NB 

Note: For mimic to operate, programmable function 49 (see page 21) must be set to 'y'.

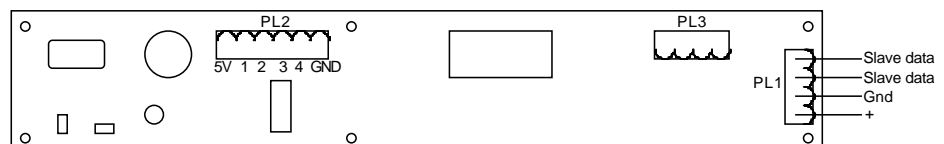
Current consumption

Below is a table of the mimic current consumption for the mimic display in its various modes of operation.

Operating Mode	Current
Nominal	80mA
Maximum (all LEDs on)	150mA
Power save (with 12 Volt stand-by)	100mA
Nominal with external power (30 Volts)	50mA

Connectors

The positions of the various connectors on the rear of the mimic board are shown below.



PL1 - is the data/power connection. This is the only connector on this board that is needed for the mimic to operate.

PL2 - this connector is used for the optional mimic relay board.

PL3 - is reserved for future expansion.

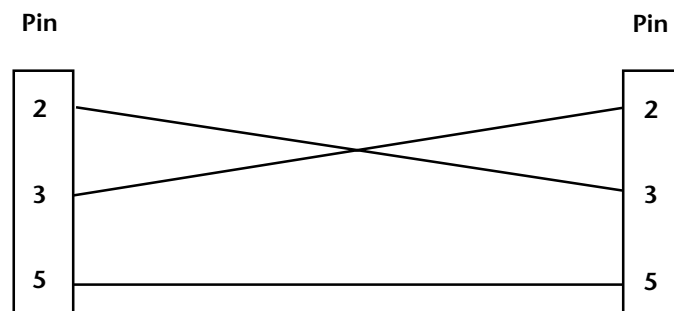
Serial Port Connections

Pin	RS232 Use
1	not connected
2	Received data
3	Transmit data
4	not connected
5	Signal Ground
6	not connected
7	not connected
8	not connected
9	not connected

Detector to PC Serial Cable Connections

9 Pin Female 'D' Connector

9 Pin Female 'D' Connector



Demonstration Mode

As the system normally takes 24 hours to reach full sensitivity, it is possible to short-cut this duration by placing the detector into Demonstration Mode. To do this, all three front buttons have to be depressed in the following sequence **WHILE THE DETECTOR IS IN FASTLEARN MODE**; Firstly press the top RESET key and hold it down. While depressing this key, simultaneously depress the lower two buttons marked TEST and ISOLATE. When this is done correctly, all front panel indicator LEDs will flash twice to show that Demonstration Mode is enabled.

If this mode has been entered, the Detector ON LEDs will flash to indicate that this condition is entered. The event is also stored in the internal log.

Note - Only use this facility during demonstrations. To remove demonstration mode a new FastLearn must be initiated.

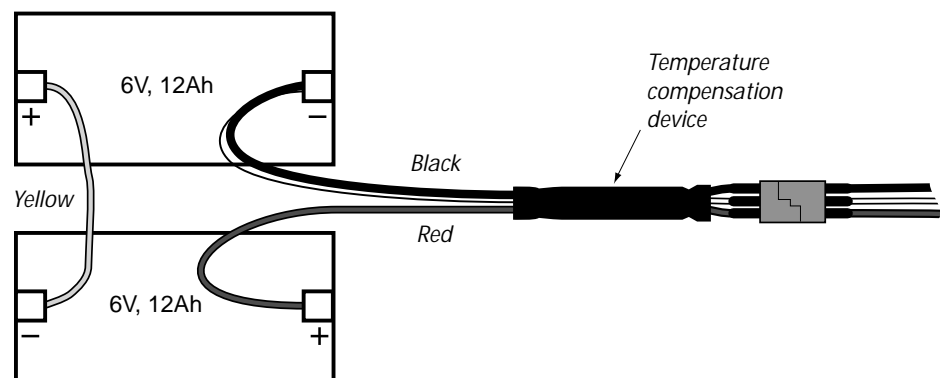
NB 

Installation and replacement of standby batteries

Ensure that only batteries of the correct type and capacity are used.

The Stratos-Quadra[®] requires 2 x 6 volt standby batteries when using the integral power supply. To avoid current surge, it is recommended that this be performed with the detector powered up.

The standard Stratos-Quadra[®] enclosure has space in the lower chamber for two 6 volt 10 amp-hour batteries. (Yuasa NP10 - 6). To connect internal standby batteries the red and black leads supplied should be connected as follows. The red lead should be connected to the red (+ or Positive) terminal on one battery and the black lead connected to the black (- or Negative) terminal on the second battery. The unused terminals of the two batteries should be joined using the yellow interconnect lead supplied.



Connecting external batteries

When a larger standby battery capacity is required, a 12 volt battery can be mounted outside the Stratos-Quadra[®] in a suitable enclosure whilst retaining the standard Stratos-Quadra[®] power supply/battery charger. The charts on page 36 indicate the *net* capacity of battery required for various standby periods.

NB 

When using external batteries it is important to retain the temperature compensation device supplied with the Stratos-Quadra[®] within the new battery compartment. The signal leads connecting the temperature compensation unit from the battery negative (- or black) must also be retained. To simplify the connection of external batteries a 1.5 metre battery extension lead set is available (Part no. 30092). Longer lead lengths can be manufactured and supplied upon request.

Current Consumption from 12 Volt stand-by battery

The following sets of figures are given to enable calculation of the appropriate stand-by battery capacity for any of the given periods.

Minimum AMP - Hours for a 12V lead acid battery

Power consumption with power save mode enabled

Detector type	Current	24 hr capacity	48 hr capacity	72 hr capacity
Stratos-Quadra	0.85	21	42	62
Quadra + ref.	1.1	27	54	80

Power consumption without power save enabled

Detector type	Current	24 hr capacity	48 hr capacity	72 hr capacity
Stratos-Quadra	1.3	32	64	94
Quadra + ref.	1.5	36	72	108

Factory default, which is set to enable the power save mode, gives longer stand-by periods due to power saving measures that include dimming the display lights and slowing the aspirator speed to minimum. Note that this has the effect of increasing the transport time and care must be taken to avoid excessive transport times into the detector. The transport time must not exceed 120 seconds for approved installations. If power save mode makes the transport time excessive, then this mode may be disabled and figures are given for the required battery capacity in this case.

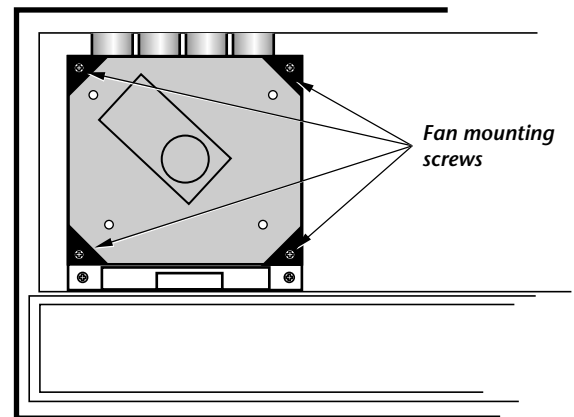
Connecting an external 24 volt DC supply.

Firstly remove and discard the mains supply fuse from the AC supply socket (shown in position 6. on page 8). Disconnect the green 3-way free socket from the plug on the Terminal board (shown in position 5. on page 7). Disconnect the three transformer wires from the free socket, insulate them, and secure away from working circuits. Connect the external 24 volts DC to the two outer terminals of the green free socket. These connections are not polarity conscious. Fit the socket back onto the plug on the terminal board. Functions 22 & 23 should both be set to 'n'.

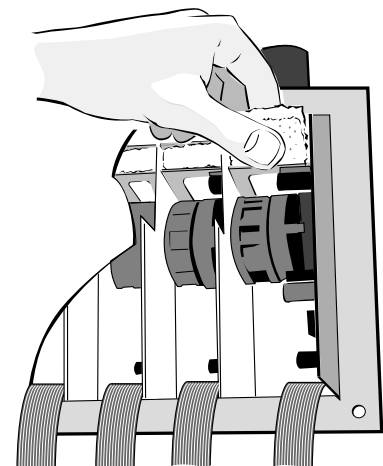
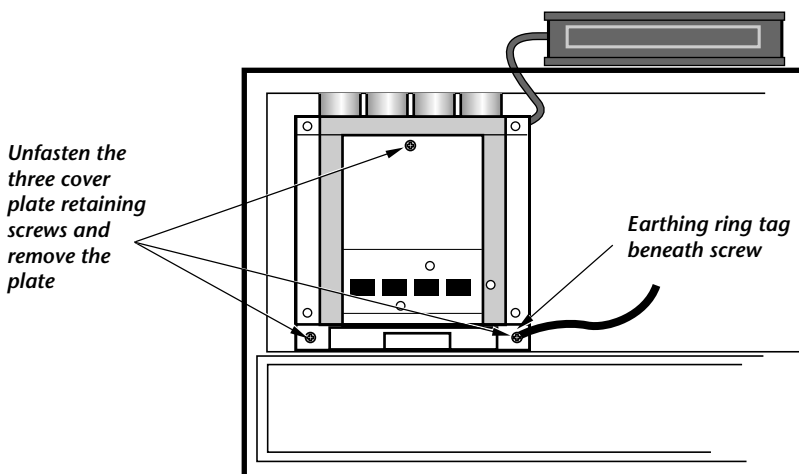
Changing the Dust Separators


It is important that the filter elements are changed at major services. The exact duration between replacement will depend upon the cleanliness of the environment. Ensure that any connection to the Fire Alarm system is disconnected before service is carried out.

- 1) Open the case door.
- 2) Leaving the detector powered up, remove the four screws from the plastic moulding of the fan on the left hand side of the case as shown below (NB, do not remove the four screws from the metal plate at the front of the fan)
- 3) Turn the fan over on its back to expose the plenum chamber. Whilst it is recommended to avoid touching the moving rotor inside the fan, this poses little risk of injury. The fan may be rested on top of the detector as shown. Remove the top cover of the plenum chamber by removing the three screws shown arrowed below and lifting the chamber top vertically out of the detector. Note that the screw shown at bottom right also secures an earthing ring tag. The chamber lid may take some effort to remove, but this is due to the airtight seal between the top and bottom halves of the chamber and does not indicate any mechanical fouling or problem.



- 4) Replace the filter elements as shown. Note: All filters should be replaced at the same time.



- 5) Replace the plenum cover plate in the reverse of 3 above, ensuring that the earthing ring tag is replaced beneath the bottom right hand screw before tightening. Replace the fan and secure the fan fixing screws. It is recommended that a magnetised screwdriver is used due to the difficulty in otherwise retrieving dropped screws from inside the detector.
- 6) The detector will go into FastLearn mode (see page 13) and will be incapable of generating alarms for 15 minutes. After a further 24 hours, full sensitivity will be regained **Note:** The positions of the filter elements are monitored by a light beam, and incorrect fitting of the filters will result in the "Separator Renew" LED lighting. If this happens, check that the filters are fully pushed home.  **NB**

Maintenance

To offer greater assurance of reliability, systems should undergo routine service in accordance with the particular Regulations, Codes of Practice or Standards applicable to the Country or organisation wherein systems are installed.

In the UK there are two documents which give specific procedures for the servicing of fire detection systems. These are :- BS 5839: Part 1: 1988. (Section 4 - Servicing) and BFPSA Code of Practice for Category 1 Aspirating Detection Systems. (Section 30)

To enhance the recommended procedures, Stratos-Quadra[®] incorporates features which provide the Service Engineer with both current and historical information on the condition of the system. These are more fully described in earlier sections of this manual.

The Stratos[®] Remote Software package is supplied with every Stratos-Quadra[®]. When loaded into a portable computer this remote software allows the service engineer to check and, if necessary, modify all the programmable features of the detector from a remote position. It also gives access to a range of test functions and viewing options. All the information can be stored in the computer and hard copy produced for future reference. (See page 22 - Connection to a computer).

The service engineer should take particular note of the following:

'Auto FastLearn Enable' - Function 52 on programmer. During routine maintenance it is sometimes necessary to power down the system. To minimise the period during which the Stratos[®] is off line, this function should be set to 'n' (no).

'Dust separator condition' - Function 51 on programmer. This is an indication of the current condition of the dust separator modules fitted to each detection area. A new or clean separator would give a reading of '99' on the display. A separator which has reached the end of its useful service life would have a reading of '80' or less. The dust separator is continually monitored by Classifire[®] and appropriate adjustments made to the detector output as the separator becomes soiled and its ability to trap both dust and smoke increases. An independent 'Separator Renew' fault indication will be given when the output reaches '80'. By checking this and comparing it with previous information and the system application it is possible to determine whether or not the separator cartridge requires replacement. **Note:** Routine visual inspection of the separator is not necessary.

NB 

Technical Data

Power supply voltage	190 - 265 VAC (RMS) 95 -132.5 VAC (RMS) 24VDC \pm 5%	}	<i>Depending on model number</i>
Size (Stratos-Quadra)	430 x 324 x 160		
Weight (Stratos-Quadra)	11.5 kg.		
Weight (Reference)	12.4 kg. (16.4 kg. with batteries)		
Operating temperature range	-10 to +60° C		
Operating humidity range	0 - 90% Non Condensing		
Sensitivity range (Obsc./Metre)	Min. = 10% Max. = 0.25%		
Sensitivity resolution (Obsc./Metre)	Max. = 0.025%		
Detection Principle	Forward Laser Light Scattering Mass Detection		
Particle sensitivity range	0.0003 μ m to 10 μ m		
Dust Discrimination Principle	Paired Pulse Amplitude Type		
Current Consumption	100mA@ 230 VAC (RMS) 200mA@ 115 VAC (RMS) 470mA@ 24VDC	}	<i>Depending on model number</i>
Battery charge Voltage	13.6 V. @ 20° C.		
Battery charge current	3 Amp. Maximum		
Stand-by period	Min. = 0 Hrs. Max. = 72 Hrs.		
Maximum sampling pipe length	200 Metres total (no single pipe greater than 100 metres).		
Sampling pipe internal diameter	15 - 25 mm.		
Chamber service intervals	> 5 Years		
Dust separator service intervals	> 3 Years (depending on environment)		
Theoretical laser life	> 1000 YEARS		
Programming of unit	On-board programmer or PC.		
Data Bus cable	4 core screened 1.5 mm ²		
Maximum Data Bus length	200 Metres		
IP Ratings	Stratos-Quadra IP50 Reference IP50		

Product Safety

This instrument is Safety Class 1 according to IEC classification and has been designed to meet the requirements of BS EN 60950: 1992 (Safety of information technology equipment, including electrical business equipment). It is an Installation Category II instrument intended for operation from a single-phase mains supply.

This instruction manual contains information and warnings, which must be followed by the user to ensure safe operation and to retain the instrument in a safe condition.

Use of this instrument in a manner not specified by these instructions may impair the safety protection provided. Do not operate the instrument outside its rated supply voltages or environmental range.

WARNING! THIS INSTRUMENT MUST BE EARTHED.

Any interruption to the mains earth conductor inside or outside the instrument will make the instrument dangerous. Intentional interruption of the earth conductor is prohibited.

When the instrument is connected to its supply, terminals inside the instrument may be live, opening the door and removing safety covers or removing any parts is likely to expose live parts.

Any adjustment, maintenance and repair of the opened instrument under voltage shall be avoided as far as possible and, if inevitable, shall be carried out only by a skilled person who is aware of the hazard involved.

If the instrument is clearly defective, has been subject to mechanical damage, excessive moisture or chemical corrosion the safety protection may be impaired and the apparatus should be withdrawn from use and returned for checking and repair.

Make sure that only fuses with the rated current and of the specified type are used for replacement. The use of makeshift fuses and the short-circuiting of fuse holders is prohibited.

The following symbols are used on the instrument and in this manual: -



Caution - refer to the accompanying documentation, incorrect operation may damage the instrument.



Alternating current.

Mains Connections

SUPPLY OPERATING VOLTAGE

The operating voltage of this instrument is shown on the protective cover fitted above the supply voltage connections.

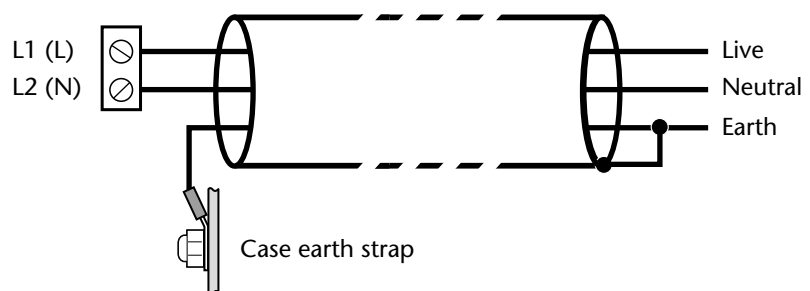
The instrument is supplied specifically for 230V operation, 115V operation, or 24V-dc operation. These voltage supply options cannot be changed once fixed by the manufacturer. The instrument contains a high speed transient protection device which is supply voltage dependent it is therefore important that the instrument is operated within its specified voltage limits, otherwise the protection device may be damaged.

SUPPLY POWER LEAD

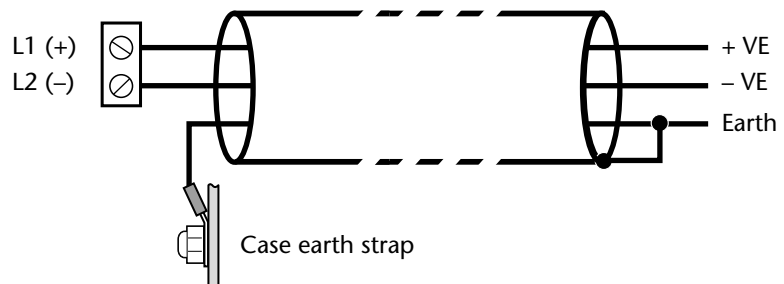
The instrument is supplied complete with a metal cable gland. To meet EMC requirements this metal cable gland together with a cable containing 3 cores plus an outer screen and outer insulation sheath must be used for mains wiring. The cable should have a core specification of 1.50mm² 30/0.25 and an overall sheath diameter of between 8 and 13mm.

The mains power connections to the instrument should be made as follows: -

For 115V or 230V



For 24V d.c.





AirSense Technology Limited

71 Knowl Piece • Wilbury Way • Hitchin • Hertfordshire • SG4 0TY
Tel. +44 (0)1462 440666 • Fax. +44 (0)1462 440888
e-mail: sales@airsense.co.uk • www.airsensetechnology.com

AirSense Technology Benelux BV

Noordkade 64 • Gebouw C3, 2741 EZ • Waddinxveen • Nederland
Telephone: +31 182 635696 • Facsimile: +31 182 635691
e-mail: schakel@cistron.nl

AirSense Oy

Huvilaniementie 21 • 48930 Tiutinen • Finland
Tel: +358 (0)208-652131 • Fax: +358 (0)401-652131

AirSense Engineering SDN BHD

49-5 Jalan PJU 1/37 • Dataran Prima • 47301 Petaling Jaya
Selangor Darul Ehsan • Malaysia
Tel. (+ 60) 3 7805 5511 Fax. (+ 60) 3 7805 5840
e-mail: airsense@po.jaring.my

AirSense SEC

Hanla 307 602 • 181 Keumkok-Dong • Boondang-Gu
Seongnam-Si • Kyungki-Do • 463-725 • Seoul • Korea
Tel. +82-31-711-1685 • Fax. +82-31-711-1686
e-mail: airsense@unitel.co.kr